

DESIGN MEMORANDUM

on

NARRAGUAGUS RIVER, MAINE

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS

July 1964

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS. 02154

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDED-R

15 July 1964

SUBJECT: Design Memorandum on Narraguagus River, Maine

TO: Chief of Engineers
ATTN: ENGCW-E
Washington, D. C.

1. In accordance with EM 1110-2-1150, Engineering and Design, Definite Project Studies, dated 15 January 1962, there are inclosed four (4) copies of the Design Memorandum on the subject project. The work to be undertaken involves dredging operations with no special design or excavation problems. The Design Memorandum is approved in accordance with paragraph 6 (b) of the above referenced authority.

2. Planning on this project is about 90% complete. Assurances that the requirements of local cooperation will be met have been executed by the Town of Milbridge. Assurances from the State of Maine are pending until the Town completes the necessary spoil area permits.

Incl (4 cys)
Des Memo

P. C. HYZER
Brigadier General, USA
Division Engineer

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PERTINENT DATA

1. A summary of the physical features and costs of the existing project for Narraguagus River, Maine is as follows:

<u>Features</u>	<u>Present Estimate (1964)</u>
Dredge a channel 11 feet deep and 150 feet wide from deep water in Narraguagus Bay to Wyman; thence 9 feet deep and 100 feet wide to Milbridge, with widening opposite Milbridge for an anchorage; and thence 6 feet deep and 100 feet wide to the proposed town landing downstream from the highway bridge, with widening near the landing for an anchorage.	\$500,000

PROJECT AUTHORIZATION

2. The uncompleted modification for the improvement of Narraguagus River was authorized by the River and Harbor Act of 23 October 1962. The project, as authorized, provides for abandonment of the existing navigation project for Narraguagus River and authorization of a new project providing for dredging a channel 11 feet deep and 150 feet wide from deep water in Narraguagus Bay to Wyman; thence 9 feet deep and 100 feet wide to Milbridge, with widening opposite Milbridge for an anchorage; and thence 6 feet deep and 100 feet wide to the proposed town landing downstream from the highway bridge, with widening near the landing for an

anchorage; all generally in accordance with the plan of the Division Engineer and with such modification thereof, as in the discretion of the Chief of Engineers, may be advisable.

3. The project modification was authorized provided that prior to construction local interests agree to:

a. Provide without cost to the United States all lands, easements, and rights-of-way necessary for initial dredging and subsequent maintenance of the improvement and for aids to navigation upon the request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of spoil, and also necessary retaining dikes, bulkheads, and embankments therefor or the costs of such retaining works;

b. Hold and save the United States free from damages due to the construction works and maintenance of the improvements;

c. Provide and maintain without cost to the United States a suitable public landing at Milbridge with adequate supply facilities, open to all on equal terms, in accordance with plans approved by the Chief of Engineers; and

d. Provide and maintain without cost to the United States adequate docking facilities at the terminals, including depths in berthing areas commensurate with the related project depths.

4. The original project, which is now abandoned, recommended the betterment of navigation above Milbridge by the removal of obstructions, such as mill waste and sunken boulders. This project was modified to provide a channel 200 feet wide and 11 feet deep for about 0.8 miles upstream to the original location of the Lower Steamboat Wharf, and then 9 feet deep to a natural anchorage off Fickett Point known as "Deep Hole". This project was completed in 1904 as far as Mitchell Point as relocation of the steamboat wharf to this point obviated the need for further dredging above this point. No provisions for local interests to meet any condition of local cooperation were required under the original River and Harbor Acts.

5. There have been no general navigation improvements made by local interests.

INVESTIGATIONS

6. Physical investigations carried out in support of the Survey Report contained in House Document No. 530, 87th Congress, 2nd Session, were made in 1959 and consisted of hydrographic, topographic, and probing surveys.

7. Subsequent to project authorization, data in the survey report was supplemented by hydrographic and probing surveys made in May and June 1964. Boring samples were taken in June 1964 to determine the character of materials to be removed from the project area. Several meetings were held with local officials. Local people voted unanimously at a town meeting held on 23 April 1964 to authorize the selectmen to sign the required assurances.

LOCAL COOPERATION

8. The requirements of local cooperation, as outlined in the authorizing document are stated in paragraph 3 above. Formal assurances have been sent to the Town of Milbridge and the State of Maine. Receipt of the assurances from the Town of Milbridge has been acknowledged and receipt of the assurances of the State of Maine is expected prior to completion of plans and specifications. The views and concurrence of local interests were obtained in conferences on the proposed project during the construction planning phase. The names of some of the principal officers and representatives contacted during the preconstruction planning phase are listed below:

Governor John H. Reed, State House, Augusta, Maine
Mr. Edward Langlois, Gen. Mgr., Maine Port Authority,
Portland, Maine
Mr. Clarence Buckley, Town Manager, Milbridge, Maine
Mr. Theodore M. Strout, 1st Selectman, Milbridge, Maine
Mr. Harold F. Pinkham, Selectman, Milbridge, Maine
Mr. Harold West, Selectman, Milbridge, Maine
Mr. George Taylor, Maine Sea & Shore Fisheries,
Augusta, Maine

LOCATION AND TRIBUTARY AREA

9. The Narraguagus River basin is located in Hancock and Washington Counties in northeastern Maine about 35 miles east of Bangor and 55 west of Eastport. The river is tidal below Cherryfield with tide ranges of 3 to 7 feet at Cherryfield and 10 to 14 feet at the

mouth. The area tributary to the Narraguagus River consists of the village of Wyman at the mouth of the river and the village of Milbridge about 2 miles upstream which form the main population centers of the Town of Milbridge. The Town has a population of about 1,100. The principal commercial activity is the canning of seafood products. U. S. Route 1 follows the Narraguagus River from Milbridge for about 4 miles to Cherryfield and crosses the river. U. S. Alternate Route 1 crosses the river at Milbridge just upstream of the navigation project over two bridges, one fixed, the other a swing bridge. The horizontal clearance on the former is 117 feet and the latter is 28 feet. Both have a 5-foot vertical clearance at high water.

10. There are two canneries which operate in Milbridge, the L. Ray Packing Company and Jaspar Wyman & Sons. A recent fire completely devastated a cannery of the Milbridge Canning Corporation, and there are no indications, at this time, that the owners intend to rebuild.

PROJECT PLAN

11. The project plan considered the most feasible and economical to accomplish the authorized work includes the removal and disposal of all materials in the channel to a depth of 11 feet deep and 150 feet wide from deep water in Narraguagus Bay to Wyman, thence 9 feet deep and 100 feet wide up to Milbridge and widened opposite Milbridge to provide a 2 acre anchorage 9 feet deep and thence a channel 6 feet deep, 100 feet wide, to the Town landing with a 2.75 acre anchorage 6 feet deep near the landing.

12. The project plan involves removal of about 275,000 cubic yards of sand, mud, gravel and sawdust. A one-foot allowable overdepth provides for inaccuracies in the dredging process at the specified depths and insures attainment of the required project depth. Removal of these materials will be accomplished by either hydraulic dredge with a disposal on spoil areas furnished by local interests or bucket dredge with disposal in an approved offshore dumping area.

DEPARTURES FROM PROJECT PLAN

13. The present project plan is essentially the same as that recommended in the authorizing document. Minor relocation of the two anchorages have been made at the request of local interests. The 6-foot anchorage at the head of the proposed channel has been relocated

on the west side of the 6-foot channel in the lee of the ledge area immediately north of the new location. The turbulence set up by the construction of the east bridge abutments during periods of ebb tide would have caused difficulty in mooring in the originally proposed anchorage location. The 9-foot anchorage opposite Milbridge has been shifted to the west side for better protection and less tidal current effects.

14. Inasmuch as Milbridge Cannery Company has not rebuilt since a disastrous fire in 1963, it is proposed to dredge only to 6 feet above L. Ray Company cannery pier at this time.

COST ESTIMATES

15. The estimate of project cost determined in the authorizing document was based on random probings and hydrographic surveys made in September 1959 during the preauthorization study phase and indicated that the materials to be removed consisted of sand, mud, gravel and clay. It was estimated that 275,000 cubic yards of ordinary material would be required to be removed from within the project limits. Volumes were in terms of place measurements and included an allowance of 1 foot overdepth, with side slopes of 1 on 3. It was anticipated that dredging would be done by the hydraulic disposal method.

16. The current estimate of cost is based on quantities determined by detailed soundings, borings, and probing surveys made in May and June 1964 and include an allowance of one foot overdepth dredging to provide for inaccuracies in the dredging operations. The present estimate of cost is based on probable disposal at sea as the only feasible spoil areas are not particularly well suited to hydraulic dredging, and the mill wastes in the river bottom make bucket dredging the more probable method.

17. Current Estimate of Costs (July 1964)

09 Channels

Dredging 6 foot, 9 foot, and 11 foot channels and
Dredging two 6 foot anchorages

275,000 c.y. ordinary material @\$1.43/c.y. \$393,000

Contingencies

57,000

09 Total Contract Costs

\$450,000

Current Estimate of Costs (July 1964)

30	Engineering and Design	17,000
31	Supervision and Administration	<u>33,000</u>
	Total Project Construction Cost (C of E Funds only)	\$500,000
	Aids to Navigation	<u>2,000</u>
	Total Project Cost (Federal Funds Only)	\$502,000

18. Comparison of Costs

	<u>Document Estimate</u> (Mar 1962)	<u>Latest Approved Estimate</u> (Jul 1963)	<u>Current Estimate</u> (Jul 1964)
Dredging including contingencies	\$450,000	\$456,000	\$450,000
Preauthorization Studies	7,000	7,000	deleted
Engineering and Design	17,000	17,000	17,000
Supervision and Administration	<u>33,000</u>	<u>27,000</u>	<u>33,000</u>
Totals	\$507,000	\$507,000	\$500,000

19. Allocation of Costs

Dredging including contingencies	\$450,000	\$456,000	\$450,000
Preauthorization Studies	7,000	7,000	deleted
Engineering and Design	17,000	17,000	17,000
Supervision and Administration	<u>33,000</u>	<u>27,000</u>	<u>33,000</u>
Total Federal (C of E)	\$507,000	\$507,000	\$500,000
Aids to Navigation	<u>2,000</u>	<u>2,000</u>	<u>2,000</u>
Total Federal	\$509,000	\$509,000	\$502,000

	<u>Document Estimate</u>	<u>Latest Approved Estimate</u>	<u>Current Estimate</u>
Non-Federal			
Spoil disposal areas	\$ 5,000	\$ 5,000	\$ 5,000
Public landing (self-liquidating)	10,000	10,000	10,000
Berth and Dock Improvements (self-liquidating)	<u>11,000</u>	<u>11,000</u>	<u>11,000</u>
Total Non-Federal	\$26,000	\$26,000	\$26,000

SCHEDULES FOR DESIGN AND CONSTRUCTION

20. Construction of the Federal dredging project will be accomplished by contract and it is estimated to require about 4 1/2 months to complete the job after the start of operations. The U. S. Fish and Wildlife Service has requested that dredging operations be confined to the period from 15 July to 1 March. The following dredging schedule provides for this reservation.

Dredging

Issue Plans & Specifications	July 23, 1964
Open Bids	Aug 13, 1964
Award Contract	Aug 27, 1964
Start Construction	Sept 15, 1964
Complete Construction	Jan 31, 1965

21. Funds in the amount of \$500,000 were allotted in FY 1964 for construction of the project.

OPERATION AND MAINTENANCE

22. Maintenance of the authorized improvement is the responsibility of the United States. Annual maintenance of the channels and anchorages consists of periodic dredging to restore project depths. The annual maintenance cost is estimated at \$7,500 exclusive of annual maintenance to navigation aids, which are estimated at \$400.

BENEFITS

23. The benefits expected to accrue from the improvement of the Narraguagus River by deepening and straightening the existing improved and natural channel from deep water in Narraguagus Bay to Milbridge to the commercial fishing industry is the elimination of fish spoilage and increased fish landings.

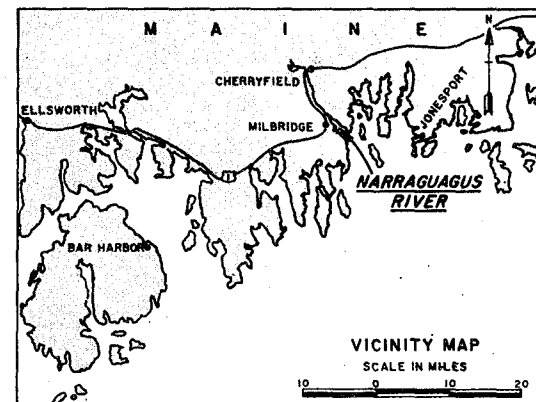
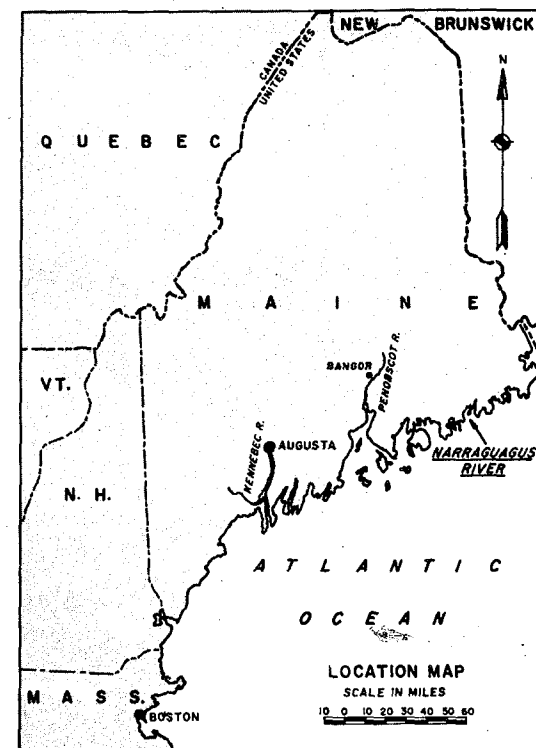
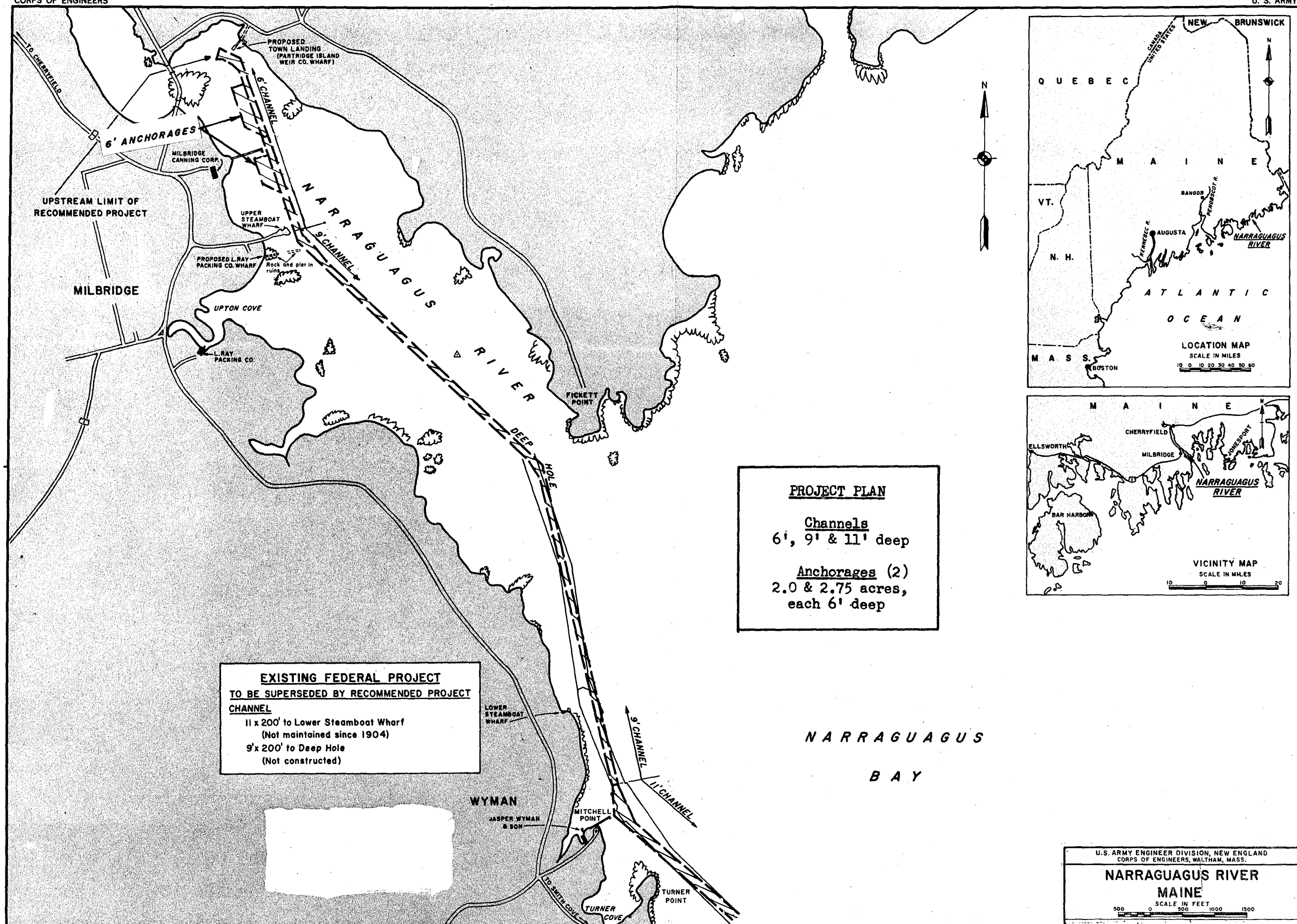
24. The economic analysis in the project document was based on use of the river by three canneries located at Wyman and Milbridge. A fire in 1963 completely razed the Milbridge Cannery Company and they have now relocated at Addison, Maine. The Milbridge Cannery accounted for about 38% of the sardine packing on the Narraguagus River. A re-evaluation of the benefits based on this loss in business and using the interest rate and project life formulated in the project document result in a benefit-cost ratio of 1.1 to 1 as compared to 1.6 to 1 in the original economic justification of the project. Expansion of the existing canneries to absorb the production output of the burned cannery would improve the economics of the project. Such expansion is a reasonable possibility.

RECOMMENDATION

25. The plan of improvement proposed in this Design Memorandum provides for a channel 150 feet wide and 11 feet deep to Wyman, thence 9 feet deep and 100 feet wide to L. Ray Packing Company pier with a 6-foot anchorage of about 2 acres and a 6-foot channel, 100 feet wide to the public landing with a 6-foot deep anchorage of about 2.75 acres. The project plan will permit the sardine carriers to enter and leave the river at any stage of the tide and eliminate fish spoilage caused by tidal delay. The plan is basically the same as recommended in the authorizing document and authorized by Congress.

26. The project plan will serve adequately the present and prospective needs of the waterway and is economically justified. It is recommended that the authorized project be constructed as described.

1 Incl
Map



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

NARRAGUAGUS RIVER

MAINE

SCALE IN FEET
0 500 1000 1500